

Listing of Claims

1. (currently amended) A digital gyrator, comprising:
a digital filter to emulate an inductance on a telephone line serviced by said digital filter, said digital filter being initially settable to a first cutoff frequency; and
an oscillation checker module to detect an amplitude of oscillation on said telephone line serviced by said digital filter, said oscillation checker module adapted to reset said digital filter to a second cutoff frequency lower than said first cutoff frequency as a function of said detected oscillation level;
wherein said gyrator resets said digital filter to a third cutoff frequency after a predetermined period of time after said digital gyrator causes telephone equipment to enter an off-hook condition.

2. (canceled)

3. (currently amended) The digital gyrator according to claim 2 1,
wherein:
said first cutoff frequency is significantly faster than said third cutoff frequency.

4. (currently amended) The digital gyrator according to claim 2 1,
wherein:
said predetermined period of time is at least one second.

5. (original) The digital gyrator according to claim 1, wherein:
said first cutoff frequency relates to a desired convergence rate when said telephone line is in a pre-charge state.

6. (currently amended) The digital gyrator according to claim 5,
wherein:
said third ~~second~~ cutoff frequency relates to a desired convergence rate after said telephone line is in a steady state.

7. (currently amended) The digital gyrator according to claim 1, wherein:

said third ~~second~~ cutoff frequency relates to a desired convergence rate after said telephone line is in a steady state.

8. (original) The digital gyrator according to claim 1, further comprising:

a digital load line correlation table to correlate values output from said digital filter into a desired voltage level.

9. (original) The digital gyrator according to claim 8, further comprising:

a codec to convert an output from said digital load line correlation table into a voltage signal for output to a DAA servicing said telephone line.

10. (currently amended) A method of regulating a signal on a telephone line, comprising:

digitizing a signal received from said telephone line;

filtering said digitized signal with a digital low pass filter having a first cutoff frequency;

detecting an amplitude of oscillation in said signal at said telephone line; and

adjusting said digital low pass filter to have a second cutoff frequency lower than said first cutoff frequency to dampen said detected oscillation if an amplitude of said oscillation indicates an unstable pre-charge state of said telephone line; and

after a pre-charge period of said telephone line, adjusting said digital low pass filter to have a third cutoff frequency relating to a steady state of said telephone line.

11. (canceled)

12. (original) The method of regulating a signal on said telephone line according to claim 10, wherein:

said first cutoff frequency is approximately 1 Hz.

13. (original) The method of regulating a signal on said telephone line according to claim 12, wherein:

said second cutoff frequency is approximately 0.1 Hz.

14. (original) The method of regulating a signal on said telephone line according to claim 10, wherein:

said second cutoff frequency is approximately 0.1 Hz.

15. (currently amended) Apparatus for regulating a signal on a telephone line, comprising:

means for digitizing a signal received from said telephone line;

means for filtering said digitized signal with a digital low pass filter having a first cutoff frequency;

means for detecting an amplitude of oscillation in said signal on said telephone line; and

means for adjusting said digital low pass filter to have a second cutoff frequency lower than said first cutoff frequency to dampen said detected oscillation if an amplitude of said oscillation indicates an unstable pre-charge state of said telephone line; and

means for adjusting said digital low pass filter after a pre-charge period of said telephone line, to have a third cutoff frequency relating to a steady state of said telephone line.

16. (canceled)

17. (original) The apparatus for regulating a signal on said telephone line according to claim 15, wherein:

said first cutoff frequency is approximately 1 Hz.

18. (original) The apparatus for regulating a signal on said telephone line according to claim 17, wherein:

said second cutoff frequency is approximately 0.1 Hz.

19. (original) The apparatus for regulating a signal on said telephone line according to claim 15, wherein:

said second cutoff frequency is approximately 0.1 Hz.

20. (new) An integrated circuit including a digital gyrator, comprising:

a digital filter to service a telephone line, said digital filter being initially settable to a first cutoff frequency; and

an oscillation checker module to detect a presence of undesirable oscillation on said telephone line serviced by said digital filter, said oscillation checker module adapted to reset said digital filter to a second cutoff frequency lower than said first cutoff frequency if said undesirable oscillation is present;

wherein said digital gyrator resets said digital filter to a third cutoff frequency associated with a steady state of said telephone line after a predetermined period of time after said digital gyrator causes telephone equipment to enter an off-hook condition.

21. (new) The integrated circuit including a digital gyrator according to claim 20, wherein:

said first cutoff frequency is significantly faster than said third cutoff frequency.

22. (new) The integrated circuit including a digital gyrator according to claim 20, wherein:

said predetermined period of time is at least one second.

23. (new) The integrated circuit including a digital gyrator according to claim 20, wherein:

said first cutoff frequency relates to a desired convergence rate when said telephone line is in a pre-charge state.

24. (new) The integrated circuit including a digital gyrator according to claim 20, further comprising:

a digital load line correlation table to correlate values output from said digital filter into a desired voltage level.

25. (new) The integrated circuit including a digital gyrator according to claim 26, further comprising:

a codec to convert an output from said digital load line correlation table into a voltage signal for output to a DAA servicing said telephone line.